CLAIMS

1. An ultrahigh frequency emitting device, having:

- at least a first and a second laser (22, 24), emitting at two different frequencies ω_1 and ω_2,

- means (25) of slaving the first and the second laser frequency-wise,

- a mosaic or an array or a bar of N elements ($N \geq 2$) (52, 54, 56, 58) placed on the path of the beam of the second laser, each element making it possible to impose a phase delay on the portion of beam which passes through it,

- N means (26, 28, 30, 32) for mixing the beam emitted by the first laser and each of the N delayed beams, and for producing N signals of frequency $\omega_1-\omega_2$,

- N antenna-forming means (34, 36, 38, 40) for emitting radiation at the frequency $\omega_1-\omega_2$.

2. A device according to Claim 1, the lasers (22, 24) being microlasers.

3. A device according to either of Claims 1 or 2, the frequency slaving means having means (27, 29, 31) for forming a beat signal from the beams emitted by the first and second lasers (22, 24), and means for

adjusting the emission frequency of one of the lasers according to the beat signal.

4. A device according to Claim 3, the means for adjusting the emission frequency of one of the lasers according to the beat signal having means (29) for carrying out a comparison between the beat signal and a reference signal provided by a reference source (31), and means (33) for modifying the optical length of the cavity of the laser whose emission frequency is to be adjusted.

5. A device according to Claim 4, the means for modifying the optical length of the cavity of the laser whose emission frequency is to be adjusted having an electro-optical (60) or magneto-optical or thermo-optical element.

6. An ultrahigh frequency emitting device, having:

- a plurality of N laser emitter pairs (61-1, 61-2; 62-1, 62-2; 63-1, 63-2; 64-1, 64-2), implemented in a mosaic or an array or a bar, each laser emitter pair having a first and a second laser emitter emitting at a first and a second frequency ω_1, ω_2, which are different,

- a mosaic or an array or a bar of N elements (52, 54, 56, 58), each of them being placed on the path of the second laser emitter of one of said laser emitter

pairs, and each element making it possible to impose a phase delay on the beam of said second laser emitter,

- means (31, 78) of slaving each laser emitter pair, frequency-wise and phase-wise and possibly amplitude-wise,

- N means for mixing each of the beams emitted by the first emitters of the N laser emitter pairs with each of the beams emitted by the second emitters of the N laser emitter pairs and delayed by the elements making it possible to impose a phase delay, and for producing N signals at the frequency $\omega_1-\omega_2$,

- N antenna-forming means for emitting radiation at the frequency $\omega_1-\omega_2$.

7. A device according to Claim 6, the laser emitters being microlasers.

8. A device according to Claim 6 or 7, the elements making it possible to impose a phase delay being electro-optical or magneto-optical or thermo-optical elements.

9. A device according to one of Claims 6 to 8, the frequency slaving means having means for forming a beat signal from the beams emitted by the first and second lasers of each laser emitter pair, and means for adjusting the emission frequency of one of the laser

emitters of the laser emitter pair according to the beat signal.

10. A device according to Claim 9, the means for adjusting the emission frequency of one of the lasers according to the beat signal having means for carrying out a comparison between the beat signal and a reference signal provided by a reference source, and means for modifying the optical length of the cavity of the laser emitter whose emission frequency is to be adjusted.

11. A device according to Claim 10, the reference source being common to all the laser emitter pairs.

12. A device according to one of Claims 6 to 11, also having means for slaving the delay imposed by at least one of the elements of the array, or bar, of N phase delay elements according to a beat signal between the beam which passes through said phase delay element of the array and another beam.

13. An ultrahigh frequency emitting device, having:

- a plurality of N laser emitter pairs (60-1, 60-2; 61-1, 61-2; 62-1, 62-2; 63-1, 63-2; 64-1, 64-2), implemented in a mosaic or an array or a bar, each laser emitter pair having a first and a second laser emitter emitting at a first and a second frequency ω_1, ω_2, which are different,

- means for slaving each laser emitter pair frequency-wise,

- means for modifying the frequency of one of the laser emitters of at least one laser emitter pair with respect to the frequency of the other laser emitter of said laser emitter pair,

- N means for mixing each of the beams emitted by the first emitters of the N laser emitter pairs with each of the beams emitted by the second emitters of the N laser emitter pairs and for producing a signal at the frequency $\omega_1-\omega_2$,

- N antenna-forming means for emitting radiation at the frequency $\omega_1-\omega_2$.

14. A device according to Claim 13, the laser emitters being microlasers.

15. A device according to Claim 13, the first and second laser emitters of each pair being constituted by a dual frequency source, emitting at the two frequencies ω_1 and ω_2.

16. A device according to one of Claims 13 to 14, the means for modifying the frequency of one of the laser emitters of at least one laser emitter pair with respect to the frequency of the other laser emitter of said laser emitter pair comprising an electro-optical modulator (82, 84, 86).

17. A device according to Claim 16, the electro-optical modulator being a semiconductor modulator.

18. A radar device having an ultrahigh frequency emitting device according to one of Claims 1 to 12, the lasers or the laser emitters (96, 98) being assembled in an array, a coupling or transmission by optical fibres (102) being implemented between the elements (100) making it possible to impose phase delays and the means (104) for mixing the emitted beams.

19. A radar device having an ultrahigh frequency emitting device according to one of Claims 1 to 12, the lasers or the laser emitters being assembled in an array and multiplexed by a multiplexer (124), an optical fibre (125) connecting the multiplexer and a demultiplexer (126).

20. A radar device according to Claim 18 or 19, the frequency slaving means also being assembled in an array.

21. A radar device according to one of Claims 18 to 20, and according to one of Claims 3 or 9, the beat signal forming means being merged with the means for mixing either the beam emitted by the first laser and each of the N delayed beams, or each of the beams emitted by the first emitters of the N laser emitter pairs with each of the beams emitted by the second emitters of the N laser emitter pairs and delayed by

the elements making it possible to impose a phase delay.

22. A device according to Claim 19, the cavities of the lasers or of the laser emitters being shifted frequency-wise with respect to one another.

23. A device according to Claim 22, the cavities being shifted frequency-wise by adjustment of their length.

24. A device according to Claim 23, each laser cavity having associated with it a Bragg grating type mirror (138, 144), implemented on a corresponding guide (142) of the multiplexer.

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